United States Patent

[11] 3,540,634

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[21] Appl. No. **707,521**
[22] Filed **Feb. 23, 1968**
[45] Patented **Nov. 17, 1970**

[54] **TILT ACTUATOR FOR PRESSURIZED SPRAY DISPENSER**
10 Claims, 6 Drawing Figs.

[52] U.S. Cl. 222/402.1
[51] Int. Cl. B65d 8/14
[50] Field of Search 222/402.13, 402.1, 402.15, 402.21, 402.22, 402.23,

[56] **References Cited**

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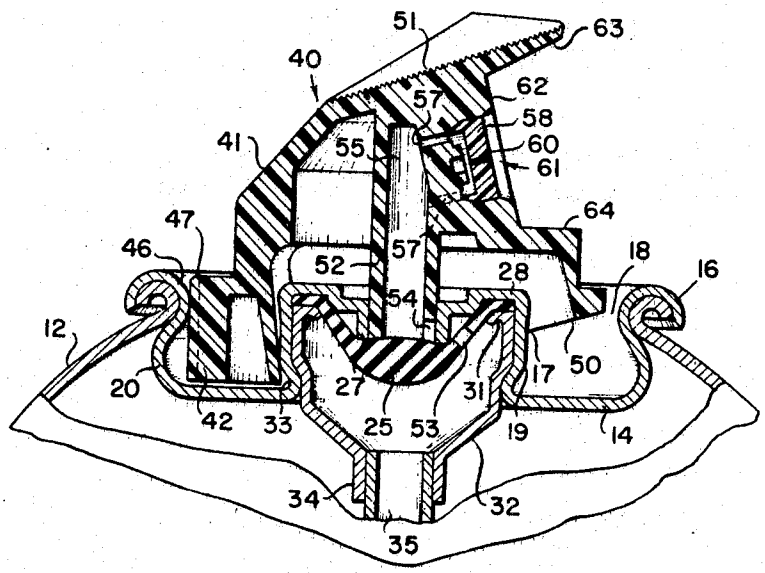
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ABSTRACT: Means for dispensing a fluid product in a spray or mist from a supply of the product in a container and under pressure, wherein a fully controllable but compact actuator is easily mounted upon the container for vertical tilting valve-opening movement about an axis disposed transversely through the actuator.



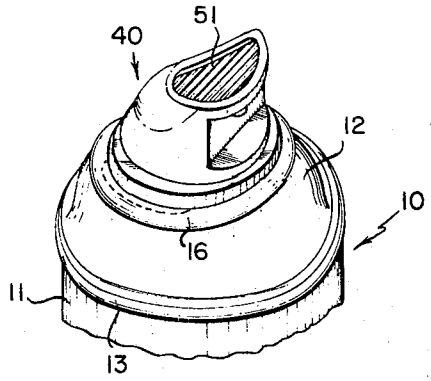


Fig. 1

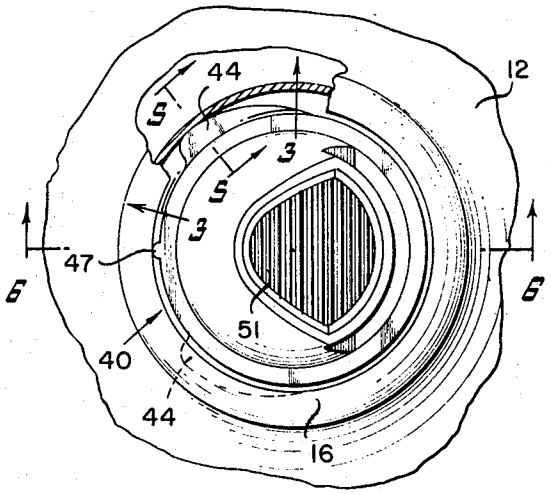


Fig. 2

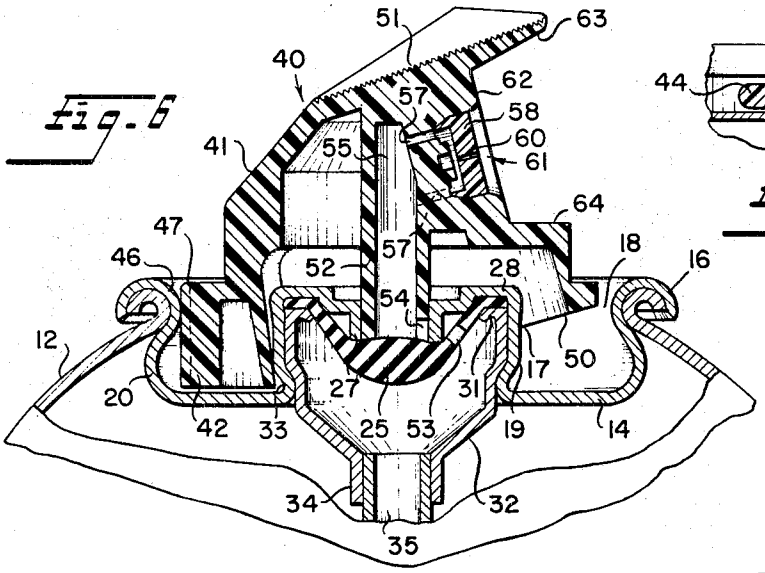


Fig. 6

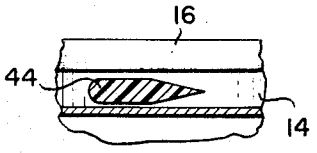


Fig. 3

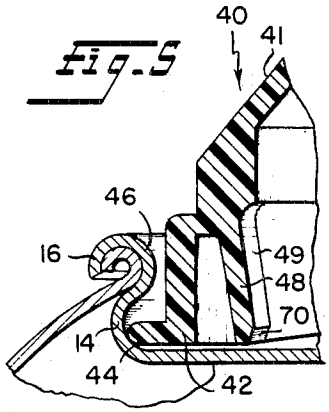


Fig. 5

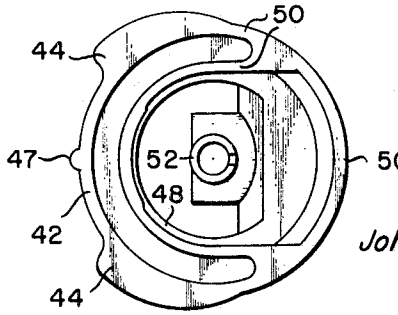


Fig. 4

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TILT ACTUATOR FOR PRESSURIZED SPRAY DISPENSER

BACKGROUND OF THE INVENTION

In the general field of the invention, there are numerous known and patented devices for actuating the dispensing of pressurized fluids from containers, many of which may be found in Patent Office Classes 222 and 239.

At least some of such art is disclosed in the U.S. Pat. Nos. 2,506,449 to C. W. Greenwood, 2,765,965 to J. B. Reswick, 3,096,002 to J. E. Focht, 3,101,876 to J.E. Ayres, and 3,270,925 to C. J. Obst. Each of these patents variously shows a dispensing container for fluid under pressure and a conventional valve seal adjacent an aperture in the container, and the seal being operable upon manual pressure applied thereto through an actuator which is generally rocked or tilted by such application of pressure, and are typical of the prior art in this regard.

Novel structural improvements of the present invention over the prior art include the provision of arcuately spaced means on the actuator to provide both an easily assembled and highly controllable compact pivotal mounting and means for retaining the actuator in position on a stemless valved container.

Numerous objects and advantages of the invention will become readily apparent as it is better understood from the following detailed description taken in connection with the accompanying drawings.

Referring to the drawings:

FIG. 1 is a perspective view of the top of a container and actuator embodying the invention;

FIG. 2 is a plan view of the actuator and a fragmentary portion of the container top, certain portions being broken away for clarity;

FIG. 3 is a sectional view taken at 3–3 in FIG. 2;

FIG. 4 is a bottom view of the actuator;

FIG. 5 is an enlarged sectional view taken at 5–5 in FIG. 2; and

FIG. 6 is an enlarged sectional view taken at 6–6 in FIG. 2.

With further reference to the drawings, FIG. 1 shows a conventional container 10 for holding a fluid product under pressure. The container comprises a body 11 united to a breast member 12 as by a double seam 13. An end closure 14 (FIG. 6) is united to the breast member in a crimped seam as at 16. A central raised portion of the closure 14 forms a valve mounting cup 17 so that an annular channel 18 is formed having inner and outer upstanding walls 19 and 20, respectively.

A stemless resilient valve seal 25 normally closes an opening at the lower end of a downturned short tubular portion 27 of the valve cup 17, and is secured at its periphery between the under surface of the top wall 28 of the valve cap and an inturned ledge 31 of a retaining member 32, which latter member is secured in the valve cup 17 by an inwardly formed groove 33. The lower end of the member 32 terminates in a short tubular portion 34 in which a conventional dip tube 35 is secured.

The dispensing actuator 40 of the present invention overlies the valve cup 17. The actuator comprises a hollow body 41 terminating downwardly in an outer curved peripheral wall or skirt 42 which, in assembly with the container, projects downwardly into the channel 18 of the end closure. A pair of ears or fins 44, 44 (FIG. 2) project radially from the actuator wall in circumferentially spaced relation thereon, and extend into engagement, as seen in FIGS. 2 and 5, with the container wall 20 beneath an inwardly extending ledge 46 of the seam crimp 16, for a purpose to be hereinafter more fully explained. A spacing projection or rib 47, disposed between the ears 44, 44 also extends radially outwardly from the wall 42 and engages ledge 46 of roll seam 16 (FIGS. 2 and 6).

An inner U-shaped wall 48 of the actuator body is spaced inwardly from and concentric with the wall 42, and is provided with an interior surface 49 that slopes downwardly and inwardly so that its inner surface presses against the upstanding

wall 19 adjacent groove 33 of the valve cup and in opposition to the pressure rib 47 against the seam 16. The lower edges 50 of the inner wall 48 and of the adjacent lower edge of the outer skirt 42 slope upwardly and forwardly and away from the surface 49, as shown in FIGS. 5 and 6, to insure adequate clearance when the actuator is rocked to a dispensing position. Also, the lower portion of the radially inwardly facing surface of inner wall 48 is beveled or chamfered as best seen at 70, FIG. 5, to facilitate initial telescoping assembly of the actuator body with the valve cup 17, as is evident.

The actuator may therefore be assembled quickly with the container by pressing or snapping the fins 44, 44 under the ledge 46 with the actuator held in a substantially horizontal position.

Manipulation of the actuator 40 to effect dispensing of the pressurized product is effected by digital pressure upon a concavely depressed area 51 on the top of the actuator. The area 51 may be ribbed as shown or otherwise configured to insure positive finger control of the actuator. Further, the concavity axis is parallel to the discharge nozzle 61, whereby normal index finger placement on the area 51 positively indicates the direction of subsequent spray projection to the user.

Pressure upon the area 51 rocks the actuator about a tilt axis extending through the actuator body, namely a line extending between the points of engagement between the bulbous ends of the ears 44, 44 with the wall 20 and ledge 46. This rocking movement also forces a central depending hollow stem portion 52 of the actuator to slide axially in the tubular portion 27 of the valve body and thereby to depress the valve seal 25 out of sealing engagement with the tubular portion 27 of the valve cup so that fluid rising under pressure in the dip tube 35 passes through one or more apertures 53 in the seal 25, and thence through an inlet port or notch 54 in the stem 52, and dispensing bore or passageway 55 in the stem, to and through the discharge nozzle 61, and dispensed as a projected mist or spray.

Upon release of actuator 40, the same returns to the valve-closed position of FIG. 6 under the combined influence of the resilience of tensioned seal 25, and the internal container pressure.

The provision of the spaced retaining fins 44, 44 coupled with the radially spaced skirts 42, 48 which are in respective engagement with the outer and inner walls defining the channel 18 provides an actuator structure which is most easily manually or mechanically coupled to the valved container by the aforesaid assembly technique. Further, the spaced fins cooperate with the closure-engaging skirts to positively prevent accidental dislodgement or separation of the actuator from the container despite possible rough handling in shipment or use.

These and other advantages derive from the location of the tilt axis in intersecting chordal relation to the actuator body, which minimizes the required tilting movement and also the flexing or yielding necessary when the actuator must be bodily moved through a greater linear distance.

Further, it will be noted that in the disclosed form of the invention, the finger-receiving concavity is disposed forwardly of the tilt axis in generally overlying relation to the discharge nozzle.

This arrangement permits in actual use a surprising degree of valve-opening control while yet providing an actuator of exceedingly compact dimensions, and on which, as noted, is both easily assembled and virtually loss proof.

The dispensing nozzle 61 is of conventional form and includes several spaced passageways 57 leading from bore 55 externally of actuator 40. An insert 58 having a central bore 60 is frictionally fitted within the nozzle opening, whereby fluid passing through the several passages 57 converges centrally of the nozzle to exit through bore 60, whereby the fluid stream is mechanically broken up into fine particles. The nozzle 61 opens outwardly from an upwardly and inwardly sloping wall 62 of the actuator.

Upper and lower walls **63** and **64** diverge outwardly from the sloping walls **62** to form a transverse channel and cooperate with the bore **61** to control the spray emerging from the orifice. The lower wall **64** protects the container and the upper wall **65** protecting the actuator depressing finger of the operator's hand from the spray.

While in the disclosed embodiment the actuator has been illustrated as having the laterally directed orifice **61**, the principles of the invention are applicable to actuators of other configurations. Thus, the actuator discharge nozzle may be axially directed in upward continuation of passageway **55** as may be desirable in a whipped cream dispenser, for example, while still retaining the two-point ear mounting and compact mode of operation described. In such instance, of course, the finger-receiving area **51** would necessarily be relocated to a locale on lower wall **64** forwardly of the tilt axis as seen in FIG. **6**.

It is thought that the invention will be clearly understood from the foregoing description, and it is obvious that various changes may be made in the form, construction and arrangement of parts without departing from the spirit and scope of the invention.

I claim:

1. A tilting valve actuator for mounting upon a valved pressure container, comprising, an actuator body, said body having a dispensing bore disposed centrally thereof and provided at its opposite ends respectively with an inlet port and a discharge nozzle, valve actuating means adjacent said inlet port operable upon movement thereof, said body having an outer lower wall of arcuate configuration disposed substantially concentrically with said inlet port, and a pair of mounting ears disposed in laterally spaced relation upon said outer wall and extending outwardly therefrom, said ears defining therebetween a tilting axis extending through said body and defining a chordal line with respect to said arcuate outer wall, whereby said actuator may be mounted on said container by said ears for compact rocking movement about said tilting axis to actuate the container valve.

2. The tilting valve actuator of claim **1** further including an arcuate inner wall on said body radially inwardly of said outer wall for cooperative centering engagement with a container.

3. The tilting actuator of claim **2** wherein said inner wall includes an inwardly facing chamfered surface at its lower extremity.

4. The tilting valve actuator of claim **2** wherein the lower surface of said actuator inclines upwardly forwardly of said tilting axis.

5. The tilting actuator of claim **2** wherein a spacing rib extends outwardly from said outer wall in spaced relation to and between said ears.

6. The tilting actuator of claim **1** wherein said discharge nozzle is laterally directed toward the opposite side of said body from said outer wall with the body further including:

an arcuate inner wall disposed radially inwardly of said outer wall for cooperative centering engagement with a container;

a finger-receiving portion at the upper portion of said body in superposed relation to said stem and forwardly of said tilting axis; and

a spacing rib extending outwardly from said outer wall in spaced relation to and between said ears.

7. The tilting actuator of claim **6** wherein said inner wall includes an inwardly facing bevelled surface at its lower extremity.

8. In a dispensing device for fluid products under pressure in a container having a discharge valve member biased to a closed position at an opening in the container adjacent an annular channel having inner and outer upstanding walls, an actuator mounted between and in contact with said channel walls for oscillatory movement toward and from said opening in the container, wherein:

said mounting for oscillatory movement includes a pair of spaced ears extending radially outwardly from said actuator into contact with said outer wall to define therebetween a tilting axis extending through said actuator;

a hollow stem portion of said actuator extends downwardly from a central portion thereof and projecting through said opening into contact with said discharge valve member;

said actuator has a passageway formed therein and extending from said hollow stem to the outer surface of the actuator; and

whereby tilting pressure applied to said actuator depresses said valve thereby releasing said product under pressure to flow through said passageway to be dispensed through said orifice in the actuator.

9. A dispensing device according to claim **8** wherein said outer channel wall is continuous between said ears and there is provided a further radial projection on said actuator disposed intermediate said ears and in engagement with said outer wall for spacing the main body of said actuator from engagement with said outer wall.

10. A dispensing device according to claim **8** wherein said actuator is provided with an inner wall disposed in centering and spacing contact with said inner channel wall.